



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
01.07.1998 Bulletin 1998/27

(51) Int. Cl.<sup>6</sup>: **F24C 15/02**

(21) Application number: **96120322.1**

(22) Date of filing: **18.12.1996**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE**  
Designated Extension States:  
**AL LT LV RO SI**

(72) Inventor: **Faccoll, Angelo**  
**Sale Marasino (Brescia) (IT)**

(74) Representative:  
**Petruzziello, Aldo et al**  
**Racheli & C. s.r.l.**  
**Viale San Michele del Carso, 4**  
**20144 Milano (IT)**

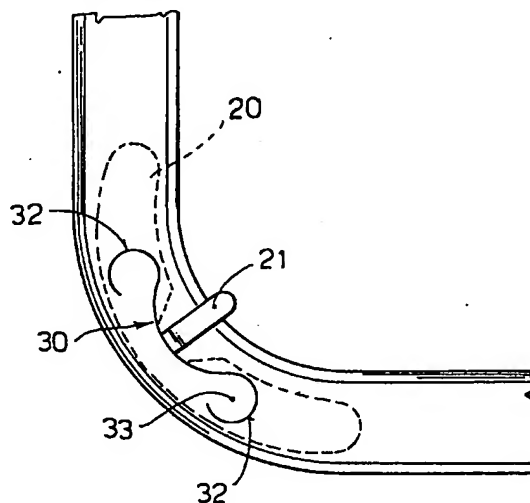
(71) Applicant: **POSA S.p.A.**  
**20093 Cologno Monzese (Milano) (IT)**

(54) **Elastomer sealing gasket particularly for cooking oven doors**

(57) An elastomer sealing gasket particularly for cooking oven doors, to be interposed between a front rim of the oven and the oven door, comprising a continuous strip (1), provided with metal elements (2, 2'), having respective hooks (21, 21') for engagement in corresponding holes provided in the oven structure, in which said metal elements (2') are inserted in a tubular

cavity (3) of the gasket through respective openings (30) made in a wall (4) defining said tubular cavity on one side (3), said openings (30) having an intermediate portion (31) extending substantially in the longitudinal direction of said strip (1) and two end portions (32) with an arched outline.

**FIG. 4**



## Description

The present invention relates to an elastomer sealing gasket, in particular of silicone rubber, particularly for cooking oven doors.

As it is known, widespread use is made in cooking ovens of elastomer gaskets interposed between the oven door and a front rim of the oven itself, to avoid heat loss during cooking.

These gaskets can be of the closed frame type, that is made up of four sides joined together to form a rectangle, or of the three-sided open-frame type, that is lacking the bottom side, the area in which there is normally less heat loss.

These gaskets were originally obtained by joining together pieces of a length corresponding to the sides of the frame, and fixing them to the oven by means of special hooking means, prepared in the gasket, engaging in special holes provided in the oven structure.

For reasons of economy, the gaskets currently used are obtained by bending, and possibly joining at the ends, a single hollow strip with hooking means situated at least in the areas where the strip is bent, that is at the corners of the frame. Metal inserts with a widened base which is inserted in a corresponding opening made in the flat bottom wall of the gasket are used as hooking means.

Said widened base of the corner insert is arched into a semi-elliptical shape and is inserted, almost always manually, into the hollow of the gasket through the opening provided in the bottom of the gasket itself. A hook which engages in a corresponding hole provided in the oven structure protrudes from the base of the metal insert, through said opening.

For three-sided gaskets, two metal end inserts are provided that are inserted through the ends of the gasket and are normally fixed with adhesive.

A gasket of this type is described for example in GB-A-2 106 974.

In particular, this document seems to foresee a straight cut in the profile of the gasket, for insertion of the base of the metal insert with hook.

Such a solution has various drawbacks.

A first drawback is that the gasket can easily tear at the ends of the cut, especially at the time of insertion of the metal insert, and consequently an adhesive must be used to hold the hook in position and prevent the tear from extending during use of the gasket.

Another drawback of this solution is due to the distortions that the straight cut undergoes when the gasket is bent at the corners of the oven door.

Another known solution also coming within the same type of gasket as that previously described is illustrated in EP-A-277 098.

According to this European patent, slots for insertion of the metal inserts with hooks are made in the hollow gasket strip by removing material. Such a solution eliminates the problem of tearing of the gasket, but

introduces other drawbacks, such as, for example, the greater complexity of the equipment that has to make the slot and, at the same time, remove the material enclosed by the outline of the slot, for example by vacuum means. Another drawback of this solution is that, if an adhesive is not used to fix the insert and thus close the slot, material from outside such as grease and the like tends to accumulate there, stagnating in the gasket and soiling it.

The aim of the invention is to eliminate the aforementioned disadvantages and in particular to solve the problems of the solution described in GB-A-2 106 974, which provides for a straight cut in the gasket, without introducing further problems, such as those of the solution proposed in EP-A-277 098, for example.

It is therefore an aim of the invention to provide a gasket for cooking ovens, in which the openings for insertion of the metal inserts do not lend themselves to tearing.

Another aim of this invention is to provide a gasket of this type, in which said openings stay covered during use of the gasket, preventing oven materials from entering the gasket.

Yet another aim of the invention is to provide an opening that adapts well to the outline of the metal insert.

Yet another aim of the invention is to provide such a gasket, in which the metal inserts can be mounted with or without the use of an adhesive.

The main aims of the invention are achieved by a gasket having the features listed in the appended independent claim 1.

Advantageous embodiments of the invention emerge from the dependent claims.

Basically, according to the invention, the opening made in the gasket to accommodate the metal insert consists of a cut with rounded ends, so as to prevent initiation of tearing. The portion joining said rounded ends of the cut advantageously has a curved shape that follows the curved contour of the base of the corner inserts, that is of the inserts suitable to be placed at the corners of the oven door.

Further characteristics of the invention will be made clearer by the detailed description that follows, referring to a purely exemplary and therefore non-limiting embodiment, illustrated in the attached drawings, in which:

Figure 1 is a schematic plan view of a four-sided closed-frame gasket according to the invention;

Figure 2 is a schematic plan view of a three-sided open-frame gasket according to the invention;

Figure 3 is a plan view of a portion of a gasket according to the invention, shown in strip at the top in the figure, and with a corner insert shown separately before being mounted in the gasket, both in a plan view and in profile;

Figure 4 is a similar view to that in Figure 3, with the corner insert mounted in the gasket, and the gasket itself shown as positioned for use;

Figure 5 is an axonometric view of the portion of gasket shown in Figure 4, and with the corner insert shown both in a position separate from the gasket and in the assembled position.

With reference to these figures, the gasket for cooking ovens according to the invention comprises a continuous strip 1 made of an elastomer, in particular silicone rubber, and a plurality of metal elements 2, 2', 2'', the function of which will be described below.

The continuous strip 1, obtained by extrusion, is of the tubular type and has a continuous inner cavity 3, defined on one side by a flat surface 4, at the longitudinal edges of which respective lips 5 are provided to improve the seal against the surface on which the gasket is applied.

On the opposite side to the flat surface 4, on the other hand, a protruding longitudinal flap 7 is provided which, in the specific case, encloses a second continuous cavity 6. The purpose of the flap 7 is to provide a tight seal against the complementary element of the oven where the gasket is interposed, in particular against the oven door. Depending upon the solutions adopted, the flap 7 can equally well be oriented so that it is directed either towards the insides of the frame, as illustrated in the appended figures, or towards the outside.

Figure 1 schematically shows a gasket 10 with four sides, forming a closed rectangular frame, whilst Figure 2 schematically illustrates a gasket 100 with three sides, forming an open frame without the bottom side.

The aforementioned metal hooking elements 2, 2' are used to fix the gaskets to the corresponding wall of the oven, whilst the metal element 2'', shown hatched in Figure 1, acts as a joining element to make the join at the ends of the closed-frame gasket 10, in Figure 1, being inserted axially into the tubular chamber 3 of the gasket at the ends thereof and being fixed there with a suitable adhesive.

The metal inserts 2', used in the three-sided gasket in Figure 2, are also inserted axially, from the ends of the gasket, into the tubular chamber 3 thereof, and fixed with suitable adhesive. These metal inserts 2' have a respective hook 21' at one end, lying along the longitudinal axis of the insert 2', for hooking into corresponding holes provided on the base of the oven.

What has been described thus far can be considered fairly usual in oven gasket structures, as can the provision of corner inserts 2 to be placed at the corners or at the 90° bends in the gasket. The innovative characteristics of the invention, through which the established aims can be reached, concern the way in which the openings are made and shaped, in intermediate points of the gasket, for insertion into the tubular cham-

ber 3 of the metal insert 2, or similar inserts, as will now be described,

As can be seen in particular in Figures 3, 4 and 5, the metal insert 2 has a flat base 20, with an arched profile, with a recess 22 in the centre of the concave inner profile, from which a hook 21 protrudes, designed to engage in a corresponding hole in the oven structure, like the hooks 21' of the end inserts 2'.

For insertion of the bases 20 of the inserts 2 in the tubular chamber of the gasket, special openings, indicated as a whole by reference number 30, are made in the flat wall 4 defining said chamber. Each opening 30, as can be seen more clearly in the plan view in Figure 3, consists of a continuous cut, advantageously made by die-cutting, comprising an intermediate portion 31, extending substantially in the longitudinal direction of the strip 1, and two terminal portions 32, with a rounded outline, advantageously shaped like the arc of a circle, for an extension greater than 180°, or at least 90°. The intermediate portion 31 also has a curved shape, with a curvature that follows that of the base 20 of the metal insert 2, and with a concavity advantageously facing in the direction in which the strip 1 is bent to form the corner of the gasket, as shown, for example, in Figure 4.

This shaping of the opening 30 solves the problems described in the preamble of this description.

In fact the rounded ends 32 of the cut facilitate insertion of the base 20 of the inserts 2, preventing tearing of the gasket during insertion, which requires a considerable elastic stretching of the material, since the opening 30 is smaller than the size of the insert 2.

The curvature of the intermediate portion 31, by following bending of the gasket during the installation phase, avoids distortions of the edges of the cut, which might otherwise be created, also considering that a certain tension is given to the gasket when it is installed on the mouth of the oven.

In addition, the fact that no material is removed when the cut 30 is made means that the flap of material 33 defined by said cut remains in position on the strip 1 of the gasket, keeping the opening for insertion of the base 20 of the insert 2 closed, as can be seen in Figure 4. Oven substances such as grease and the like are thus prevented from entering the cavity 3 in the gasket through the opening 30, as these substances would tend to stagnate, soiling the gasket and giving it an unpleasant smell.

Adhesive can also be optionally provided to fix the inserts 2 in the corresponding openings 30.

Obviously the cuts 30 made in the gasket can also be used for insertion of metal inserts with a straight instead of a curved base, for example of inserts to be placed at intermediate points, instead of at the corners, of the gaskets 10, 100. Two of such intermediate inserts have been schematically illustrated in Figures 1 and 2, and with these the same advantages are achieved, as those described previously with reference to the corner inserts

Obviously the invention is not limited to the particular embodiment described above and illustrated in the appended drawings, but changes to the details within the reach of an expert in the field may be made and come within the scope of the invention itself, as defined by the claims that follow.

#### Claims

1. A sealing gasket made of an elastomer particularly for cooking ovens, to be interposed between a front rim of the oven and a corresponding door, said gasket comprising a continuous strip (1), provided with metal inserts (2, 2'), having hooks (21, 21') able to engage in holes provided in the oven structure, said metal inserts (2) being inserted in a tubular cavity (3) of said continuous strip (1), through respective openings (30) made in a flat wall (4), defining said tubular cavity (3) on one side, characterized in that each of said openings (30) consists of a continuous cut comprising an intermediate portion (31) extending substantially in the longitudinal direction of the strip (1), and two respective end portions (32) with a curved outline.
2. A gasket according to claim 1, characterized in that said end portions (32) with a curved outline are arcs of a circle.
3. A gasket according to claim 2, characterized in that said terminal portions (32) shaped like an arc of a circle extend over an angle greater than 90°.
4. A gasket according to any one of the preceding claims, characterized in that said intermediate portion (31) of the opening (30) has an arched outline.
5. A gasket according to claim 4, characterized in that said intermediate portion (31) of the opening (30) with an arched outline has its concavity facing in the direction in which the continuous strip (1) is bent to form a gasket (10, 100).
6. A gasket according to any one of the preceding claims, characterized in that said metal inserts (2) have a base (20) with a curved profile, and are suitable to be placed at the corners of said gasket (10, 100).
7. A gasket according to any one of claims 1 to 5, characterized in that said metal inserts (2) have a straight base and are suitable to be placed at intermediate points along the sides of the gasket (10, 100).
8. A gasket according to any one of the preceding claims, characterized in that said continuous cut of

each opening (30) defines a flap of material (33) that remains in place and keeps said opening closed during use of the gasket (10, 100).

9. A gasket according to claim 1, in which said metal inserts (2') are inserted from the two ends of said continuous strip (1) which is bent to form a three-sided open gasket (100).
10. An opening (30) for insertion of a metal insert (2) in a tubular cavity (3) of a gasket (10, 100) for cooking ovens, obtained by bending a continuous strip (1) characterized in that said opening (30) comprises an intermediate portion (31) substantially extending longitudinally to said continuous strip (1) and two end portions (32) with a rounded outline, defining a flap of material (33) that remains in position on the gasket and keeps said opening (30) closed during use.

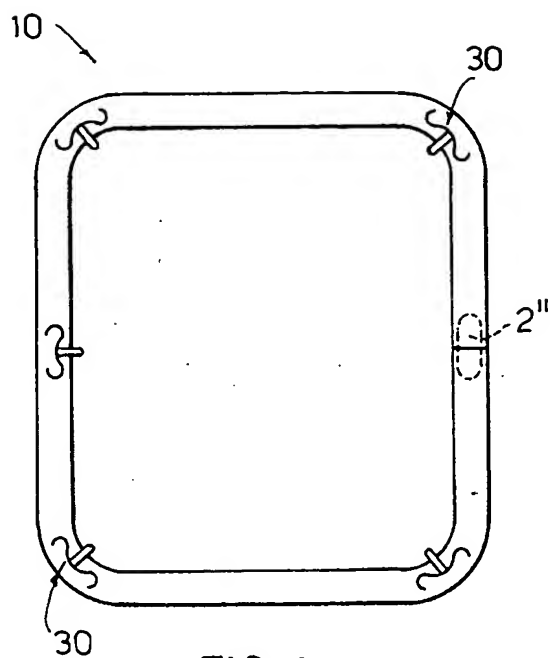


FIG. 1

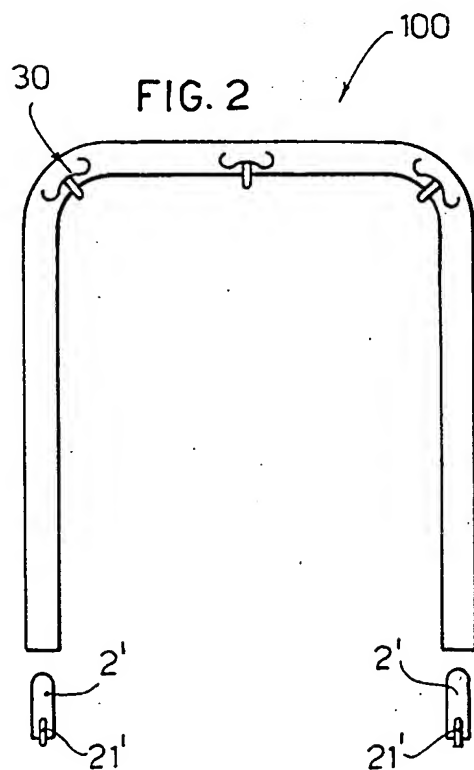
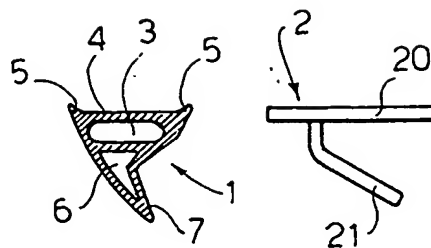


FIG. 2

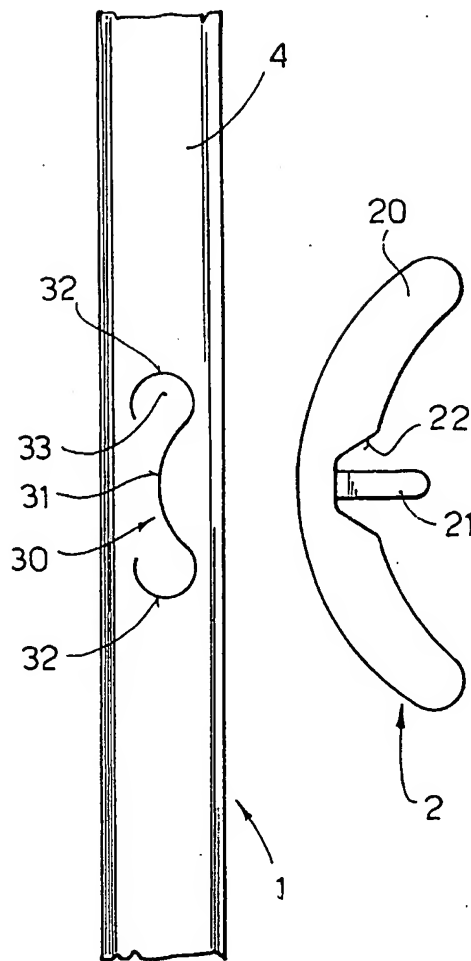


FIG. 3

FIG. 4

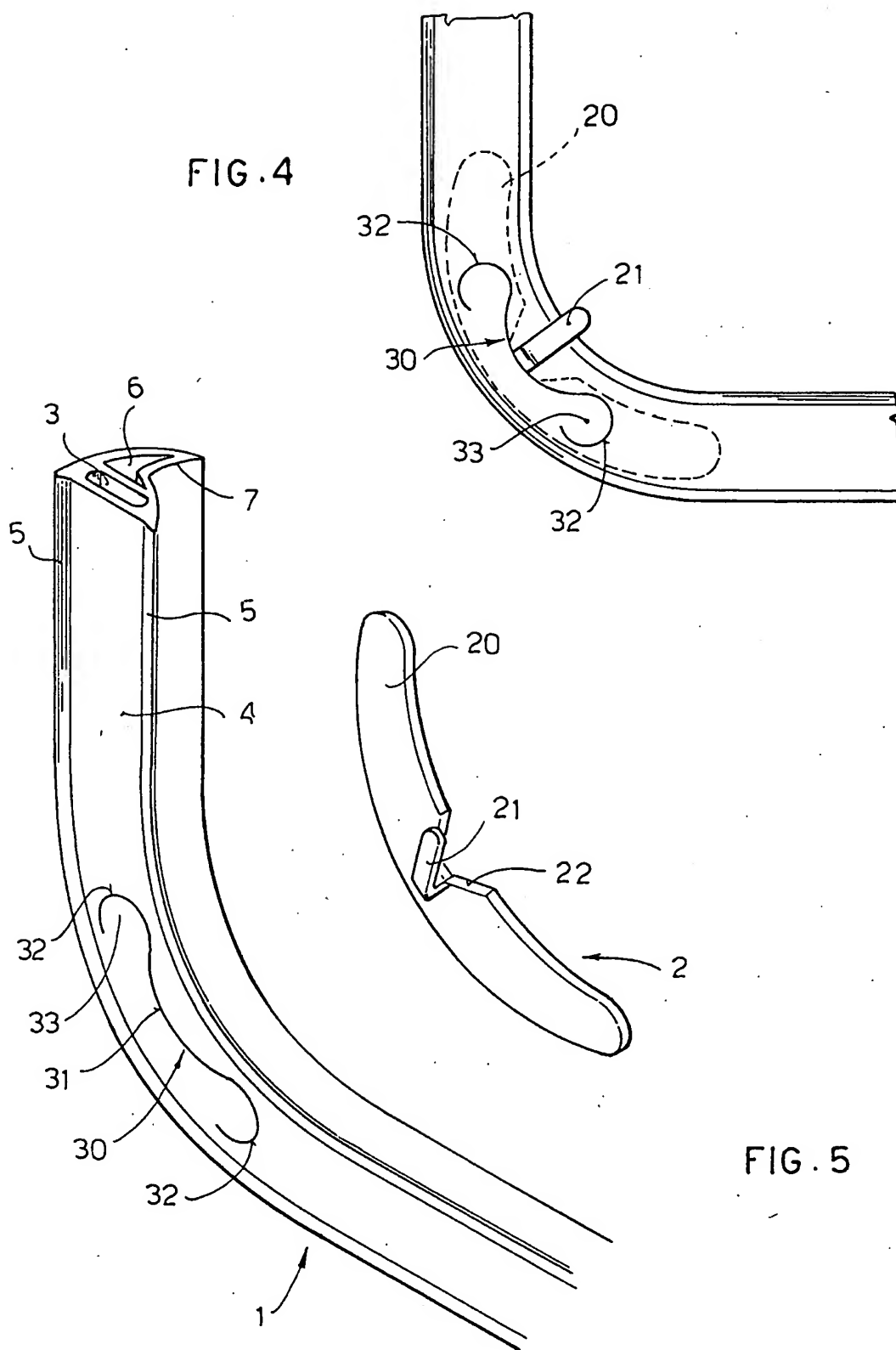


FIG. 5



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 96 12 0322

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,A	EP 0 277 098 A (GIAT SRL) 3 August 1988	1	F24C15/02
D,A	GB 2 106 974 A (SILICONE ALTIMEX LIMITED) 20 April 1983	1	
A	GB 2 113 827 A (SILICONE FABRICATIONS LIMITED) 10 August 1983	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F24C F25D A47L A21B
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>3 June 1997</b>	Examiner <b>Vanheusden, J</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 150 01.92 (P0401)